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(54) Title: METHOD AND APPARATUS FOR PRODUCTION OF A CONTINUOUSLY EXTRUDED PRODUCT

(57) Abstract: Continuous extrusion means in which aluminium or copper feedstock with a nominal diameter approximately 4% greater than the width of the circumferentially extending groove in a continuous extrusion wheel is fed from a feed reel to a centreless lathe or shaving machine set to machine the feedstock to a diameter corresponding to the width of the groove. In thereby removing the surface layer, surface impurities are removed and feedstock with a clean, non-oxidised surface is delivered directly to the groove without the intervention of feed rollers liable to cause distortions in the feedstock whilst ensuring that substantially constant forces arise between the machined-to-size feedstock and the walls of the groove. This reduces any tendency of irregular feed toward the associated abutment and thus enhances the constancy of the product quality as well as avoiding problems arising from oxidation and/or surface imperfections.

**TITLE: METHOD AND APPARATUS FOR PRODUCTION OF A  
CONTINUOUSLY EXTRUDED PRODUCT**

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**DESCRIPTION**

This invention relates to a method of and apparatus for the production of a continuously extruded product. EP 071490 describes the production of a continuously extruded product including a feed reel means arranged to supply feedstock generally of substantially circular cross-section to a circumferentially extending groove in a wheel.

According to one aspect of the present invention machining means are positioned to receive feedstock from the feed reel means and to discharge machined feedstock to the circumferentially extending groove, with the machining means being arranged to remove at least a surface layer from the feedstock and form a circular cross-section dimensioned as a close fit within the circumferentially extending groove.

Preferably the machining means include a centreless lathe.

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Alternatively, the machining means includes a shaving head.

Desirably, drive motors for the feed reel, the machining means and the wheel are electronically linked such that the speed of the feed reel and the speed of the machining means are adjusted in accordance with the speed of the wheel.

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According to another aspect of the present invention, there is provided a method of production of a continuous extrusion product including supplying feedstock of substantially generally circular cross-section from a feed reel to machining means, machining the feedstock to remove at least a surface layer and form a circular cross section feed dimensioned as a close fit within the circumferentially extending groove, feeding the machined feedstock directly from the machining means to the circumferentially extending groove and driving the wheel carrying the machined feedstock around in the circumferentially extending groove to contact an abutment and discharge through a die to form an extruded product.

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Preferably, the feedstock is of aluminium.

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Alternatively the feedstock is copper.

Desirably, the machining means operates to a tolerance of  $\pm 0.1\text{mm}$  on a typical diameter of  $12.7\text{mm}$  of feedstock.

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In one embodiment, the extrusion plant includes, in in-line series, a feed reel means, machining means, a continuous extrusion machine and a product take-up reel.

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The feed reel means includes an electric drive motor and is arranged to deliver aluminium feedstock in the form of an approximately circular cross-section aluminium wire rod through guide rollers to a centreless lathe having an electric drive motor.

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The centreless lathe is positioned closely adjacent the continuous extrusion machine and delivers machined feedstock directly to a parallel sided circumferentially extruding groove formed on the rotating wheel of the continuous extrusion machine driven by an electric motor.

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The continuous extrusion machine discharges extruded product from a die connected through a passage in a die body mounted adjacent an abutment extending into the circumferentially extending groove and delivers the extruded product to the product take-up reel driven by an electric motor.

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Respective electronic speed control means are associated with each of the electric motors with the speeds at the feed reel, of the centreless lathe and at the take-up reel being electronically linked to the speed of rotation of the rotating wheel of the continuous extrusion machine.

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In operation, aluminium feed stock with a nominal diameter to  $\pm 0.2\text{mm}$ , or 4% (i.e. approximately  $2\text{mm}$ ) greater than the width, axially of the wheel, of the groove, is fed from the feed reel to the centreless lathe which is set to machine the feedstock to a diameter corresponding to the width of the groove thereby removing a surface layer from the feedstock. In removing the surface layer, surface impurities are removed and

75 feedstock with a clean, non-oxidised, surface is delivered directly to the groove without  
intervention of feed rollers liable to cause distortions in the feedstock whilst at the same  
time ensuring substantially constant forces arising at the walls of the groove between  
the feedstock, which has been machined to close tolerances, and the walls of the  
80 groove. This reduces any tendency toward irregular feed of the feedstock around the  
groove toward the abutment and thus enhances the constancy of the product quality  
arising from extrusion as well as avoiding problems with oxidation and/or surface  
imperfections inherent in separating the two processes.

85 It will be apparent that metals other than aluminium, such as copper, may be  
utilised as feedstock and that the extrusion product may be delivered at a controlled  
rate as cut-to-length bar stock rather than being wound on to a take-up reel.

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## Claims

1. Continuous extrusion means including a feed reel means  
5 arranged to supply feedstock generally of substantially  
circular cross-section to a circumferentially extending  
groove in a wheel, characterised in that machining means  
are positioned to receive feedstock from the feed reel  
means and to discharge machined feedstock to the  
10 circumferentially extending groove, with the machining  
means being arranged to remove at least a surface layer  
from the feedstock and form a circular cross-section  
dimensioned to be a close fit within the circumferentially  
extending groove.
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2. Continuous extrusion means as claimed in Claim 1,  
characterised in that the machining means includes a  
centreless lathe.
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3. Continuous extrusion means as claimed in Claim 1,  
characterised in that the machining means includes a  
shaving head.
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4. Continuous extrusion means as claimed in Claim 1,  
Claim 2 or Claim 3, characterised in that drive motors for  
the feed reel, the machining means and the wheel are  
electronically linked such that the speed of the feed reel  
and the speed of the machining means are adjusted in  
accordance with the speed of the wheel.
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5. A method of production of a continuous extrusion  
product including supplying feedstock generally of  
substantially circular cross-section from a feed reel to  
machining means, machining the feedstock to remove at least  
35 a surface layer and form a circular cross-section feed  
dimensioned to be a close fit within a circumferentially

5 extending groove in a wheel, feeding the machined feedstock directly from the machining means to the circumferentially extending groove and driving the wheel carrying the machined feedstock around in the circumferentially extending groove to contact an abutment and discharge through a die to form an extruded product.

10 6. A method of production of a continuous extrusion product as claimed in Claim 5, characterised in that the feedstock is of aluminium.

15 7. A method of production of a continuous extrusion product as claimed in Claim 5, characterised in that the feedstock is of copper.

20 8. A method of production of a continuous extrusion product as claimed in Claim 5, Claim 6 or Claim 7, characterised in that the machining means operates to a tolerance of +/- 0.1mm on a typical diameter of 12.7mm of feedstock.

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